

REMARKS

Claims 1 and 3-19 are all the claims pending in the application. Claim 2 has been canceled without prejudice and/or disclaimer. New claims 18 and 19 have been added. Reconsideration and allowance of all the claims are respectfully requested in view of the following remarks.

Drawings

Although the Examiner did not object to the drawings, Applicants have submitted proposed changes thereto in order to maintain consistency between the drawings and the specification. Specifically, proposed changes have been made to Fig. 7 so as to correctly indicate which data points correspond to the present invention, and which to the comparative example.

Claim Rejections - 35 U.S.C. § 112

The Examiner rejected claims 1-17 under § 112, 2nd paragraph, as indefinite. Specifically, the Examiner noted that the expression “finely dispersed” is a relative expression which makes the claim indefinite. Applicants have removed the term “finely” and, thereby, have broadened and clarified the claim. Therefore, this rejection is believed to have been overcome.

Claim Rejections - 35 U.S.C. § 103

The Examiner rejected claims 1-17 under §103(a) as being unpatentable over the alleged prior art set forth on page 1, lines 6-16 of the specification (hereinafter the APA) in view of Japanese reference number 60-174842 (hereinafter JP ‘842). Applicants respectfully traverse this rejection because the references fail to establish *prima facie* obviousness in that they fail to teach or suggest every element as set forth in Applicants’ claims.

Claim 1 sets forth a machined retainer, of a rolling bearing, made of a material wherein crystals of intermetallic compound are dispersed in a base material comprising a Cu alloy, wherein the Cu alloy contains Pb in an amount in the range of from greater than 0 wt% to 0.4 wt% or lower.

As noted by the Examiner, the APA discloses a machined retainer of rolling bearing containing Al, Mn, Ni, and/or Fe elements, but does not contain Pb. The Examiner then asserts that the Pb element in JP '842 is optional as in the presently claimed invention and, thus, could be eliminated or not selected.¹ Contrary to the Examiner's assertion, however, Pb in the present invention is required in an amount in a range of from greater than 0 wt% to 0.4 wt% or lower. In contrast to the Pb content as set forth in claim 1, JP '842 teaches either 0 wt% or 2-10 wt%, each of which are outside of Applicants' claimed range.

That is, JP '841 teaches a bearing material that contains, by wt%:

55-65 Cu

25-35 Zn, and

2-6 Al

and consists further of alloy components containing at least 1-3 kinds selected from the following:

0.2 - 3 Ni,

0.5 - 4 Fe,

1 - 2.5 Ti,

2 - 10 Pb,

0.5 - 2 Si, and

0.5 - 2 Zr.

The bearing material is crystallized with the intermetallic compound particles having 5 - 30 μ maximum length and ≥ 400 Vickers hardness on the surface at 3 -15% area rate. Since such bearing material contains the prescribed amount of Ni, Fe, Ti, Zn, Mn, etc., the intermetallic compound consisting of these components is produced and is precipitated in a needle-like or lump state into the base alloy by selecting optimum conditions for production, cooling, etc. The resistance to wear is thus improved. Accordingly, it is possible to provide a bearing material for a turbo charger having higher resistance to wear and seizure than the bearing material made of

¹ Office Action at page 4, item 8.

the conventional lead bronze by consisting said material of respectively prescribed ratios of Cu, Zn, Al, and further 1-3 kinds among Ni, Fe, Ti, Pb, Mn, Si, and Zr and specifying surface area, etc.

In JP '842, the Pb element is described as an optional element. That is, JP' 842 teaches that either 0 wt% or 2-10 wt% of Pb is contained in the bearing material for turbocharger. Further, the JP '842 does not teach or suggest the importance of an upper limit of 0.4 wt% Pb as recited in independent claims 1 and 18. According to the present invention, when the Pb amount is kept less than 0.4 wt%:

- 1) the surface roughness can be remarkably lowered as clearly shown in Fig. 7;
- 2) the surface hardness can be increased as clearly shown in Tables 4 and 6;
- 3) the volume of abrasion can be reduced as clearly shown in Table 4; and
- 4) the impact resistance can be improved as shown in Table 6.

Further, the upper limit (0.4 wt%) of Pb as recited in the claims is much lower than the range of 2-10 wt% taught by the JP '842. Therefore, JP '842 does not teach or suggest the presently claimed invention and, in fact, teaches away from the present invention.

Moreover, JP '842 teaches the technical idea of a bearing material, for a turbo charger, having higher resistance to wear and seizure than the bearing material made of the conventional lead bronze, so that one of ordinary skill in the art would not apply the teachings of JP '842 to a machined retainer of a bearing as recited in the present invention.

In as much as the Examiner may attempt to apply this rejection to new claim 18, Applicants respectfully submit that the APA and JP '842 fail to teach or suggest all the elements as set forth in claim 18.

Claim 18 sets forth, a machined retainer of rolling bearing comprising a Cu alloy, and Pb, wherein the Pb is included in an amount in the range of from greater than 0 wt% to 0.4 wt% or lower. Again, neither the APA nor JP '842, either individually or in combination, teach or suggest Applicants' claimed Pb content.

For the above reasons, neither claim 1 nor claim 18 are rendered obvious by the APA and JP '842. Likewise, dependent claims 3-17 and 19 are not rendered obvious by these references.

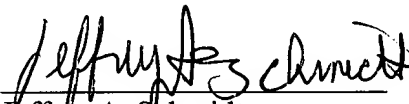
Conclusion

In view of the above, reconsideration and allowance of this application are now believed to be in order, and such actions are hereby solicited. If any points remain in issue which the Examiner feels may be best resolved through a personal or telephone interview, the Examiner is kindly requested to contact the undersigned attorney at the telephone number listed below.

The USPTO is directed and authorized to charge all required fees, except for the Issue Fee and the Publication Fee, to Deposit Account No. 19-4880. Please also credit any overpayments to said Deposit Account.

Respectfully submitted,

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APPENDIX
VERSION WITH MARKINGS TO SHOW CHANGES MADE

IN THE CLAIMS:

Claim 2 has been canceled.

The claims have been amended as follows:

1. (Amended) A machined retainer, of a rolling bearing, made of a material wherein crystals of intermetallic compound are [finely] dispersed in a base material comprising a Cu alloy, wherein the Cu alloy contains Pb in an amount in the range of from greater than 0 wt% to 0.4 wt% or lower.

4. (Amended) The retainer as set forth in claim [2] 18, wherein said retainer has a surface hardness [of] which is 110 or higher in Vickers hardness (HV).

6. (Amended) The retainer as set forth in claim [2] 18, wherein the content percent of the intermetallic compound is 5 to 30% in [an] area ratio.

12. (Amended) The retainer as set forth in claim [2] 18, wherein [said retainer is formed with the Cu alloy containing] the amount of Pb is reduced to an amount in the range of from greater than 0 wt% to 0.1 wt% or lower.

Claims 18 and 19 have been added as new claims.